Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
http://dnr.state.il.us

Pat Quinn, Governor
Marc Miller, Director

August 5, 2011

Ms. Kim Holmes, Zoning Administrator
Woodford County Zoning Dept.
115 N. Main
Eureka, IL 61530

Mr. William Belshaw, President
Village of Metamora
102 N. Davenport
P.O. Box 1070
Metamora, IL 61548-1070

Mr. Randall Toepke, Superintendent
Metamora Township High School
101 W. Madison
Metamora, IL 61548

RE: Metamora Township High School Wind Turbine, Metamora, Woodford County
Endangered Species Consultation Program
EcoCAT Review #1201227

Dear Officials:

The Department received this proposed action from PNE Wind USA to initiate consultation in accordance with the *Illinois Endangered Species Protection Act* [520 ILCS 10/11], the *Illinois Natural Areas Preservation Act* [525 ILCS 30/17], and Title 17 *Illinois Administrative Code* Part 1075.

The Metamora Township High School District, with assistance from PNE Wind USA, proposes to construct and operate a 1.5-MW wind turbine on property owned by the Village of Metamora at its South Wastewater Treatment Plant (WWTP) on Walnut Creek, which lies outside the Village within the zoning jurisdiction of Woodford County. Each government has a role in authorizing, funding, or performing this proposed action, and is thus a party to consultation.

This letter states the biological opinions of the Department of Natural Resources pertaining to Natural Areas and those endangered or threatened species protected by the statutes, identified above, which require Counties, Local Governments, and state agencies to consult with the Department.

Mackinaw River Illinois Natural Areas Inventory (INAI) Site. The Mackinaw River INAI Site includes several tributaries. One of these is Walnut Creek, which is included in its entirety, from its source to its confluence with the Mackinaw River mainstem. The WWTP is directly adjacent and discharges to Walnut Creek about four miles below its source. The turbine will be located between 350 and 600 feet from the channel.

Commercial wind turbines can pose several issues for aquatic habitats. Because the power cables for this machine are unlikely to pass beneath Walnut Creek, potential adverse effects are limited to noise (vibration) and shadow flicker.

Even when stationary, turbines impart vibrations into the ground under windy conditions. This noise can be transmitted significant distances, depending on the geology of the particular site. Many aquatic species possess "lateral lines" of sensitive cells which detect subtle variations of pressure; these senses help them detect prey, avoid predators, and navigate to, from, and around features in the water. Wind turbine vibrations have the potential to decrease the effectiveness of these sensory cells at some frequencies through excessive stimulation, which may result in stress, which may, in turn, cause animals to leave or avoid areas in the water body where vibration levels are intolerable. Such responses would degrade biodiversity in the affected reach of the stream.

However, at this point, the WWTP average discharge is on the order of 0.24 cfs, and on many days the effluent comprises the greater portion of the flow. Photos confirm that at this point the Creek is neither deep nor wide and offers limited habitat, while the preponderance of effluent in the flow is likely to depress the numbers of species which would normally be present under such conditions. Consequently, even if the turbine noise travels some distance before attenuation, and even if some species leave the area without becoming habituated to turbine noises, these changes are unlikely to be significant to downstream biodiversity.

Although shadow flicker is often considered only in terms of its potential nuisance to humans, it may also adversely affect aquatic and terrestrial animals; it may elevate stress to the point some animals seek to leave the area of effect, while other species are apparently unaffected.

The WWTP is located in a southward bight in the stream course, so that the turbine will be sited north of the channel, with the nearest reach having a southwest/northeast orientation. This positioning means shadow flicker will not fall on the channel in the winter, nor in the late fall or early spring. Shadow flicker will begin to fall on the stream near the spring equinox and will continue to do so until after the autumnal equinox, but only in the mornings and evenings, and the reaches of the stream which are affected will shift a little each day. If spawning habitat were rare in this stream and happened to lie in reaches affected by flicker, it could be of more concern, but habitat both upstream and downstream appears to be fairly homogenous, and similar to the reaches affected by flicker. Consequently, even if some species abandon or avoid habitat affected by flicker, other reproductive opportunities are abundant, so that overall productivity of the system should remain unchanged.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify

the Mackinaw River INAI Site.

Black Partridge Park Woods Land & Water Reserve and INAI Site. This large Reserve is located west of Metamora, approximately three miles northwest of the turbine site. On flat open ground, turbines in this class may be visible for 15 miles under clear conditions. However, the Reserve lies in the watershed of Partridge Creek on the opposite side of the divide which follows State Route 116. In addition, most points within the Reserve are within or adjacent to woodlands, where trees limit views of the horizon. Consequently, the turbine is unlikely to be visible to Park visitors.

While the turbine will have no significant impact on the Park, the Park may be significant to the turbine. At the headwaters of Partridge Creek, the Reserve offers suitable habitat to the Indiana Bat and other bat species, as well as offering suitable breeding habitat and staging habitat for numerous migratory birds, such as the Cerulean Warbler and the Black-Billed Cuckoo. Animals approaching, departing, or residing in the Reserve may interact with the turbine and risk death or injury as a result of collisions.

It is the biological opinion of the Department the proposed action is unlikely to adversely modify the Black Partridge Park Woods Land & Water Reserve.

Indiana Bat, *Myotis sodalis*. Since 2009, the potential for interactions between the federally-listed endangered Indiana Bat and wind turbines has become a major concern for the wind energy industry and federal and state wildlife agencies. As demonstrated by fatalities of Indiana Bats at an Indiana wind farm in 2009 and 2010, this species is vulnerable to collision with utility-scale wind turbines, especially during migration, when all known fatalities have occurred.

Some Indiana Bats migrate significant distances, up to 300 miles, to their summer habitats. But many travel lesser distances, and some spend the summers in the vicinity of their winter roosts. In April 2010, the Department conducted a telemetry study to follow the migratory flights of gravid female Indiana Bats as they emerged from hibernation in the Blackball Mine near LaSalle-Peru. The majority of bats entered the forests along the Illinois River and, after foraging for a few hours or days, moved downstream along the River in the direction of Peoria. The return migration may not necessarily retrace the outward movement. One of the Bats was tracked to a location near La Rose in Marshall County, about fourteen miles north of Metamora. Because most of the Indiana Bats at the Mine had already left before the study began, it is possible that western Woodford County, with significant expanses of riparian forests, supports summer maternity colonies of this species.

Despite the conventional wisdom that Indiana Bats (and most others) are found in and near forested habitat, this does not hold true during migration, so that wind energy projects located in very open landscapes retain the potential to kill bats. This is the case at the only wind facility so far documented to kill Indiana Bats. Consequently, siting a wind energy facility in open agricultural areas does not necessarily reduce or eliminate the potential for bat mortality, although it may reduce the potential for casualties among bats in local reproductive or bachelor colonies.

Walnut Creek in the vicinity of the WWTP does not provide suitable roosting habitat for the Indiana Bat. However, this species often forages over ponds and lagoons, so the stream and the WWTP offer an attractive feeding area for bats. While this may increase the number of bats active in the vicinity of the turbine, most bats, including the Indiana Bat, typically forage at elevations less than one hundred feet and are unlikely to collide with the turbine blades or suffer baro-trauma from blade turbulence. However, if colonies of this species exist southwest of Metamora, and their return flight to LaSalle-Peru does not follow the Illinois River but takes an overland path, the risk of collision with the turbine remains.

It is the biological opinion of the Department that construction of a 1.5-MW wind turbine at the Metamora WWTP, as proposed, is unlikely to adversely modify the essential habitat of the Indiana Bat and is unlikely to result in a prohibited "take" of this species. New information could alter this conclusion.

Other Bats. No other species of bat which is currently listed by the State of Illinois or the federal government is known to occur in Woodford County. However, the Fish & Wildlife Service is currently evaluating whether to list the **Northern Long-Eared Bat**, *Myotis septentrionalis*, sometimes called the Northern or Northeastern Myotis, as endangered under the federal *Endangered Species Act*. The State of Wisconsin recently listed the **Big-Brown Bat**, *Eptesicus fuscus*; the **Little Brown Bat**, *Myotis lucifugus*; and the **Tricolor Bat** (Eastern Pipistrelle), *Perimyotis subflavus*; in addition to the Northern Long-Eared Bat.

All of these species occur in Woodford County, and all are often found beneath wind turbines during mortality studies.

The major threat to these species, which has prompted the listing efforts, is the advent of a new fungal disease caused by the organism *Geomyces destructans*, dubbed **White-Nose Syndrome** (WNS) because infection of bats typically results in the growth of white sporing bodies around the bat's muzzle. First observed in New York in 2006, the fungus is spreading rapidly through bat hibernation sites, where the fatality rate has approached 98% of all bats present in some cases. The Indiana Bat is also susceptible to this infection, which threatens its extinction.

To date Illinois hibernation sites have not been infected, but the fungus has already been found in Indiana, Kentucky, and Missouri, and it is approaching Wisconsin via Canada. It is expected to enter Illinois this year or next. If fatality rates are similar to those experienced in the Northeast, either state or federal listing of these species can be expected within the next decade, or sooner. Because the life of a wind turbine is generally set at 20 years, it is likely that one or more of these four species of bats will be listed as endangered or threatened within the life of the proposed turbine, an event which will impose a regulatory burden on the turbine's owner.

It has become standard practice in the Illinois wind energy industry for developers to perform pre-construction bat monitoring with acoustic detectors, both to assess over-all bat activity and to identify the presence of particular species. (Full-spectrum detectors enhance the probability of correctly identifying high-frequency-emitting bat species, which include the *Myotis* genus.) This method is most effective if at least one of the detectors is placed as near to the projected turbine

nacelle elevation as possible. However, the failure to identify the calls of a bat species through this method does not establish they are absent from the vicinity.

Following construction, one or two seasons of mortality studies, which entail searching for carcasses beneath the turbine, are usually undertaken in an effort to quantify the level of lethality the turbine poses to birds and bats, and to which species.

Recommendation #1. The Department recommends MTHS should conduct at least one full activity season (March-November) of pre-construction acoustic bat activity monitoring to assess or quantify the levels of bat activity within the project area, attempting to determine how often Indiana Bats and other species are active in the vicinity of the proposed wind turbine. MTHS should anticipate and plan for post-construction mortality studies to quantify the numbers of particular bat species taken at this location, so that this information is readily available to support applications for Incidental Take Authorizations and Permits when additional species are listed by the state or federal governments.

Bald Eagle, *Haliaeetus leucocephalus*. The Bald Eagle is no longer listed as endangered or threatened under either the federal or state endangered species statutes. But the Bald Eagle remains protected under both the federal *Migratory Bird Treaty Act* and the federal *Bald and Golden Eagle Protection Act*. Draft federal siting guidelines for wind turbines call for consideration of an incidental take permit for the Bald Eagle under the latter statute if an important Bald Eagle activity area exists within ten miles of a proposed turbine location.

Active Bald Eagle nests exist on both the Mackinaw and Illinois Rivers at distances of around 13 miles from the Metamora South WWTP. However, the Illinois River itself is just over ten miles from the site and constitutes an important migratory corridor for the Bald Eagle. It is also true that the Illinois population of breeding Eagles is rapidly expanding, so that new nests within ten miles of this turbine are a distinct probability during its lifetime.

Recommendation #2. The Department recommends MTHS and its partners consult with the Fish & Wildlife Service, Rock Island Field Office, concerning potential impacts to the Bald Eagle.

Migratory Birds. Wind turbines in Illinois do kill birds, but not very many. In Illinois, the average loss is between 1 and 2 birds per turbine per year for commercial-scale machines, and losses are seldom from the same species. While some bird losses can be expected, a machine in this proposed location may have the potential for higher-than-average losses.

The Village of Metamora is situated on the edge of a major migratory flyway, the Illinois River Valley. Although waterfowl stage from wetlands along the River, they often fly overland during migration, and their angles of ascent may carry them five miles or more before they achieve an altitude above the typical height of a commercial wind turbine. Where the land also rises, as is the case here, additional miles are needed to achieve a safe altitude. Nevertheless, remarkably few birds killed at wind turbines are waterfowl, given their level of exposure.

Song birds (passerines) comprise more than 80% of birds killed at wind turbines. Many of these species migrate at night, although at altitudes well-above the typical wind turbine. However,

fatalities correlate with inclement weather, which may force flocks closer to the ground and into the rotor sweep of the turbines. Passerines tend to follow river valleys, too, but their interest is more in the riparian forests, which offer food and shelter between migratory stages. While this turbine will be sited outside the riparian forests which exist west of Metamora, it may still be close enough to pose a hazard to migrating passerines as they approach or depart.

Within 20 miles of Metamora there are breeding records for the **Cerulean Warbler**, the **Black-Billed Cuckoo**, the **Loggerhead Shrike**, and the **Upland Sandpiper**, all of which are listed by the State of Illinois as "endangered" or "threatened." The risk of collision for any of these species is not necessarily high once they have established a breeding territory, but they may be in jeopardy during migratory movements.

The Warbler requires interior forest habitat, and so is unlikely to establish a territory near the turbine. The Shrike and the Cuckoo both nest in trees and shrubs at the forest edge or in savanna-like settings, and so have some potential to select breeding sites near the turbine. (Shrikes have collided with wind turbines in Wyoming, but we have no details on the conditions which may have contributed to such events.)

The Upland Sandpiper has the greatest potential to nest near this turbine. Often classified as a grassland bird, in recent years most identified breeders have been nesting in corn or soybean stubble, or in grassed waterways in agricultural fields. This is the case for a half dozen pairs near Minonk, roughly fourteen miles from the proposed site. The male of this species conducts courtship through acrobatic flights which carry it above, below, and through elevations where turbine blades rotate, and this may place it at risk of collision. There is also the potential that construction activities may disturb an undetected nest. To avoid this possibility, the construction site should be carefully observed for the presence of Sandpipers before work begins.

The **Osprey** is a State-listed migratory raptor which may be pre-disposed to interactions with wind turbines. This species is now nesting along the Illinois River, along the Kishwaukee River near Rockford, and in the Chicago metro area. However, significant numbers of Osprey breed in Wisconsin, which may be the origin and destination of many of the birds observed migrating through Illinois.

Ospreys eat fish, but many Ospreys nest significant distances from their primary hunting areas. In Cook County, some pairs make a thirty-mile round trip to Lake Michigan to bring prey to their chicks. It might be expected that Ospreys would follow major river systems during migration, but this appears not to be the case: one migrating bird was observed five miles west of the Middle Fork of the Vermilion River (Wabash Drainage) in an agricultural landscape; two have been observed (spring and fall) passing through the White Oak project area in McLean County, and in September 2007 a juvenile Osprey was injured by a turbine east of Bloomington.

Most Ospreys bred in Illinois are reared in nests on man-made platforms: utility poles, communications towers, stadium lights, etc. Consequently, this species may seek out similar man-made structures on which to rest during migration. The Osprey struck in McLean County suffered only a dislocated wing and was able to fly within 24 hours of treatment of its injury.

This implies a “near-miss” or an encounter with the innermost limb of a rotor blade, which, in turn, suggests the bird attempted to find a perch on the turbine nacelle.

Because Metamora is near the Illinois River, and because the flight path of the White Oak Ospreys is slightly east of the Metamora turbine site, it is possible a turbine in this location may be at greater risk of an Osprey interaction than many others.

It is the biological opinion of the Department the proposed action is unlikely to adversely affect the habitat of State-listed endangered or threatened migratory birds, but the possibility of prohibited taking cannot be ruled out.

Recommendation #3. The Department recommends that MTHS perform periodic post-construction avian mortality monitoring, during migration seasons, to evaluate the hazard this machine poses to migratory birds. Periodically, MTHS should perform breeding bird surveys in the vicinity of the turbine to assess the hazard potential to State-listed migratory birds residing in the area. MTHS may partner with or sponsor local volunteers, students, or bird-watching groups, to compile observations of migratory birds and their locations near Metamora. While rarely attaining statistical validity, such data is still useful in assessing collision risk. Seeking an Incidental Take Authorization from the Department for State-listed animals should be considered if the risk of prohibited taking is deemed unacceptable.

Consultation on the part of the Department is terminated, unless Woodford County, the Village of Metamora, or the Metamora Township High School District desires additional information or advice related to this proposal. In accordance with 17 Ill. Adm. Code 1075.40(h), you must notify the Department of your decision regarding these recommendations, whether you will:

- Proceed with the action as originally proposed;
- Require the action to be modified per Department recommendations (please specify which measures if not all will be required); or
- Forgo the action.

This consultation is valid for two years unless new information becomes available which was not previously considered; the proposed action is modified; or additional species, essential habitat, or Natural Areas are identified in the vicinity. If the project has not been implemented within two years of the date of this letter, or any of the above listed conditions develop, a new consultation is necessary.

The natural resource review reflects the information existing in the Illinois Natural Heritage Database at the time of the project submittal, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project’s implementation, the applicant must comply with the applicable statutes and regulations. Also, note that termination does not imply IDNR's authorization or endorsement of the proposed action. Please contact me if you have questions regarding this review.

Sincerely,

Keith M. Shank
Impact Assessment Section
Division of Ecosystems and Environment
keith.shank@illinois.gov
(217) 785-5500

cc: Jenny Skufca, Illinois Nature Preserves Commission
Keith Kurtz, PNE Wind USA